

August 23, 2019

Shimon Mizrahi
Rainier Commons LLC
918 S. Horton Street, Suite 1018
Seattle, WA 98134

Subject: Polychlorinated Biphenyl (PCB) Substrate Testing
CONCRETE - POST VISUAL CLEARANCE
South Wall Building 15

Site Address: Rainier Commons, LLC
3100 Airport Way S, Seattle, WA

NVL Project#: 2012-494

Dear Mr. Mizrahi:

Per your request, NVL Laboratories Inc. (NVL) tested concrete substrate, following final visual clearance and approval of paint removal work, for the presence of Polychlorinated Biphenyls (PCBs), at the Rainier Commons site per the conditions for such testing pursuant to Condition 8 of the EPA's December 18, 2013 Risk Based Disposal Approval for Rainier Commons. The purpose being to collect and provide data sufficient for the EPA to conclude that the visual performance standard is adequate to verify both removal of the PCB bulk waste and that when the visual clearance performance standard is met no further clean-up is likely required of the remaining substrate, with any remaining detectable levels of PCBs registering below the threshold for unrestricted use.

EXECUTIVE SUMMARY

Utilizing the "Sample Location Selection" process delineated in the *Rainier Sampling Plan for Verification of Concrete Substrate Once Visual Clearance Standard Met* (the NVL *Substrate Sampling Plan*), NVL randomly selected representative locations of the concrete substrate. These randomly selected locations were then tested for the presence of PCBs after all paint abatement work was completed and after all work areas were cleared utilizing the visual clearance performance standard and procedures.

Laboratory analysis of the concrete substrate did not detect the presence of PCBs greater than 1 ppm with a Reporting Limit of less than 1 ppm. These results re-confirm that the visual clearance standards already approved for brick, mortar, and sandstone are also effective for concrete substrates. As was originally noted in our report titled *PCB Substrate Testing, Concrete – Post Visual Clearance*, dated April 19, 2019; these results further confirm that PCBs contained in the historical layers of paint applied to the concrete did not migrate into the concrete substrate. These findings meet the requirements of Condition 8 of the EPA's Risk Based Disposal Approval (RBDA) for Rainier Commons.

Based on the findings, it is recommended that Rainier Commons again request modification to the RBDA to eliminate concrete substrate sampling requirements, effective for any additional work. Substrate testing is destructive and requires creating a hole by drilling out a quantity of the exterior wall on buildings that are to remain in service.

BACKGROUND

Condition 8 of the EPA's Risk Based Disposal Approval for Rainier Commons (RBDA) requires testing of each type of substrate, from which historical layers of paint have been removed, to determine if PCBs contained in the paint migrated into the substrate, or remain at greater than 1 ppm following visual clearance pursuant to the visual clearance performance standards applicable to the work as set forth in Condition 7 of the RBDA and Exhibit 11 of the Phase II Individual Phased Work Plan (Phase II IPWP). Substrate test results confirm whether or not the visual clearance performance standard is sufficient to clear that particular type of substrate and can be relied upon, without further additional destructive substrate testing, to clear that particular type of substrate for unrestricted use. That is to say the substrate does not contain PCBs greater than 1 ppm.

The Individual Phase Work Plan for Phase I (IPWP-I) Close-out report was submitted to the EPA for review and approval on July 10, 2015. Included in this report was the Polychlorinated Biphenyl (PCB) Substrate Sampling Report for abatement work performed on Building 13 and the west elevations of Buildings 10 and 11. The Substrate Sampling Report concluded that PCBs had not migrated into either the sandstone or concrete substrates tested.

The Individual Phase Work Plan for Phase II (IPWP-II) was submitted to the EPA for review and approval on February 24, 2015. The initial IPWP-II submittal included substrate sampling data collected during IPWP-I activities, as well as a request for modification to the Risk-Based Disposal Approval (RBDA) to eliminate the need for further substrate testing, based on prior sampling results.

Supplement 2 to IPWP-II was submitted to the EPA for review and approval on May 8, 2015. This Supplement added the south elevation on Building 15 to the scope of the overall IPWP-II work statement. Photographs of the affected section of Building 15 were included with the Supplement 2 submittal.

Supplement 3 to IPWP-II was submitted to the EPA for review and approval on December 21, 2015. The purpose of this Supplement was to prioritize the south elevation of Building 15 ahead of the other work areas included in IPWP-II. This request was necessitated by the ongoing construction of a new Urban Storage building directly to the south of Building 15. The new building was to be constructed within 16 inches of Building 15's exterior wall, making subsequent abatement activities impossible. Therefore, expedited approval for this particular wall was requested.

The south wall of Building 15 was then designated as IPWP-II, Segment a (IPWP-IIa). The remaining work package for IPWP-II was designated as IPWP-II, Segment b (IPWP-IIb), whose approval was expected shortly after IPWP-IIa's approval. With these two Segments receiving what was anticipated to be back-to-back" approvals, the IPWP-II Close-out report was anticipated to include both Segments a and b. At the time of Supplement 3's submittal, there continued to be no indication that the south wall of Building 15 was composed of any materials other than brick and mortar, as stated on page 4, comment response #8 of the Supplement. Repeated reviews of both the exterior and interior elevations of the south wall did not detect other substrates.

After receiving EPA approval for the IPWP-IIa plan on July 11, 2016, Rainier Commons commenced abatement activities to effect removal of all exterior paint from the south elevation of Building 15. During the course of abrasive blasting (July 15th through August 4th, 2016) paint

removal from a small portion (approximately ½ of 1 percent of the entire elevation) of the wall area was revealed to be made of a concrete substrate. This strip of concrete measures approximately 16 inches wide, by 14 ½ feet long, or about 19 square feet in total. The total area revealed is smaller than a single sampling grid prescribed in 40 CFR 761.265, titled *Sampling Bulk Remediation Waste and Porous Surfaces*, which uses a grid area of 25 square feet.

Having not yet received concurrence from the EPA regarding the modification to the RBDA affecting substrate sampling; but believing that approval for IPWP-IIb was imminent; Rainier Commons requested that NVL Laboratories collect a limited substrate sample from the small concrete area that was uncovered during abatement operations on Building 15. Should substrate sampling continue to be required, the Building 15 concrete sample would represent one data point for this type of material. The remaining two concrete samples would be obtained from Buildings 8 and 9 during IPWP-IIb, similar to the manner in which concrete substrate samples were distributed among the various walls in Phase I. The Phase IIb buildings are composed entirely of concrete, making them more representative of the concrete substrate.

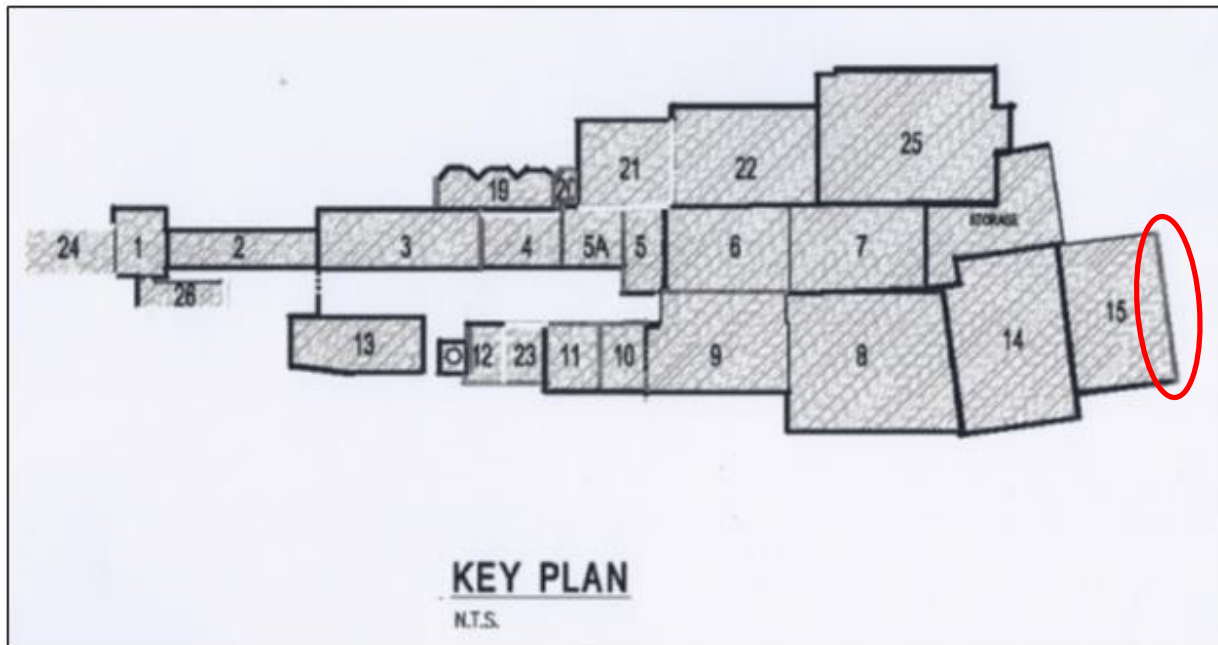
On October 13, 2016, NVL obtained a sample of the concrete substrate from the south elevation of Building 15. The sampling protocol used was modeled after the approved substrate sampling plan submitted for IPWP-I use. Laboratory analysis of the substrate sample determined PCB content was 0.522 ppm, well below the 1.0 ppm level approved for unrestricted use.

On July 25, 2019, the EPA published Amendment 6 to the RBDA, excluding sandstone from additional substrate sampling, based on the sampling report, dated April 19, 2019, provided by Rainier Commons, to the EPA. A companion report regarding concrete substrates, also dated April 19, 2019, was also submitted to the EPA. The concrete report utilized the identical sampling methodology and analytical processes, with results similarly favorable to those of sandstone. The Phase I work was unequivocally approved, without restrictions. An Amendment to the RBDA removing concrete substrate sampling from future work has not yet been received.

Lacking approval of IPWP-IIb and now in the position of needing to split out and create two separate close out reports for Phase II, one for Phase IIa and a follow-on report that will include the Phase IIb areas, when abated, Rainier Commons requested NVL to conduct additional, limited concrete substrate sampling on the south wall of Building 15. This was done utilizing the methodology employed during IPWP-I sample collection and testing. NVL obtained two additional concrete substrate samples from Building 15's south elevation. The results are reported upon herein.

SITE MAP

The circled area on this site map shows the location of building 15 at Rainier Commons.



METHOD

Field collection and subsequent laboratory analysis was performed in accordance with the NVL *Substrate Sampling Plan* (Exhibit 11 to Phase 1 IPWP), revised to include and match the EPA SOP. All concrete surfaces identified during the abatement process were equally included in the sample site selection process, making the samples randomly selected fully representative of the total available sample population.

Details in NVL's *Substrate Sampling Plan* included:

- Having a Certified Industrial Hygienist (CIH) overseeing all sample collection, analysis, data interpretation and reporting involved with this assessment
- Specific procedures to randomly select sample testing locations
- Specific protocol for identifying the samples
- Specific instructions for sample collection
- Field QA/QC procedures, which included collecting field duplicate and split samples
- Specific requirements for the laboratories selected for sample analysis

The laboratories selected for sample analysis were:

- NVL Laboratories, Inc.
- Fremont Analytical Inc.



Both are accredited laboratories for analysis for PCB Aroclor content via EPA Method 8082. A Reporting Limit of less than 1 ppm was requested at the time of sample submission consistent with the requirements of the RBDA and unrestricted use.

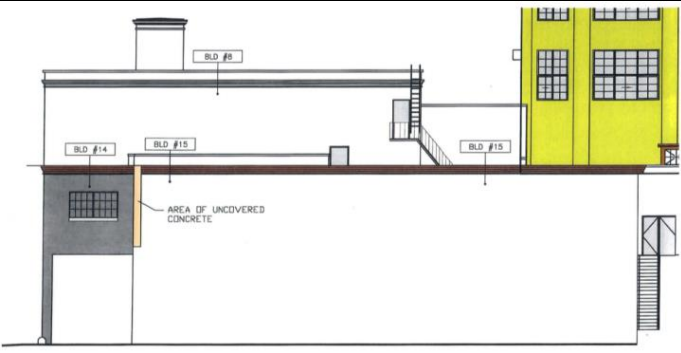
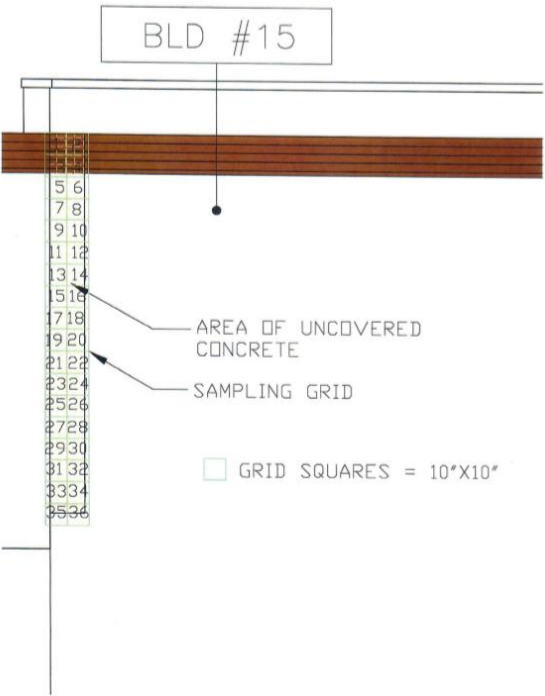
TESTING

NVL, with Dave Leonard CIH oversight, conducted the sample collection to test for PCBs. This substrate sampling was conducted following the conclusion of all Phase IIa work to remove PCB-containing paint coatings from the building.

SAMPLE LOCATION SELECTION

The sample location selection protocol identified in NVL's *Substrate Sampling Plan* involved using a grid system. The following details how the grid pattern was established for Buildings 15 where the concrete substrate was located.

1	 <p>Building 15, South Elevation</p>	<p>Building 15, South Elevation prior to abatement</p>
2	<p>BUILDING 15, SOUTH ELEVATION CLOSE-UP (PRE-ABATEMENT)</p>  <p>CONCRETE FACADE</p>	<p>Building 15, South Elevation Pre-Abatement</p> <p>Close-up</p> <p>Showing location concrete facade</p>

3		Diagram Showing Concrete Area South Elevation Building 15
4		Assigning Grid Identification on Close-Up Cut-Out of Concrete Area South Elevation Building 15 Grid locations #1 to #36

Once this grid pattern system was established, the sampling locations were selected using the random number generator at www.random.org.

After the random selection of the sampling locations, the selection of the location for duplicate and split samples was also performed using the random number generator at www.random.org.

The following summarizes the locations identified using the random number generator:

Sample Location	Grid	QC
1	29	-
2	22	split
3	08	duplicate

Sample identification was also made per the protocols identified in NVL's *Substrate Sampling*

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Plan and are indicated as follows:

Sample	Sample Location	Grid	Sample Identification
1	1	29	101316-Bulk
2	2	22	080619-15S-22-S1
3	2	22	080619-15S-22-S2
4	3	08	080619-15S-08-DUP1
5	3	08	080619-15S-08-DUP2

SAMPLE COLLECTION

Surface debris, if any, was removed using a clean brush and cloth as described in NVL's *Substrate Sampling Plan* prior to drilling.

Samples were collected using an impact hammer drill with a 5/8 inch concrete drill bit to generate a uniform, finely ground powder. Depth was controlled to be no more than one half inch by marking the depth with tape on the drill bit.

The drill bit was cleaned and decontaminated before use, and after each sample was obtained per the description in the sampling plan, which included scrubbing with water containing detergent, followed by rinsing with clean water and then rinsing/wiping the surface with hexane.

Clean, previously unused disposable gloves were used at each sample location.

Two holes needed to be drilled to obtain an approximated 10 grams of material per sample.

The split sample was collected at the same time as the original sample at that location. This was achieved by drilling four holes to generate approximately 20 grams of material that was then put into a single sample container. The closed sample container was then shaken to mix the sample and then half of the contents were then put into the "split" sample container leaving approximately 10 grams of material in each container.

The field duplicate sample was a separate sample collected as close as possible to the same point as the original sample at that location. Prior to the sample being collected, the same procedures for cleaning and decontaminating the drill bit were followed.

OBSERVATIONS

The following photographs note observations made when testing occurred. Note: the bucket truck aerial lift used to gain access for sampling was designed only for single-person use, making obtaining "work-in-process" photographs not viable.

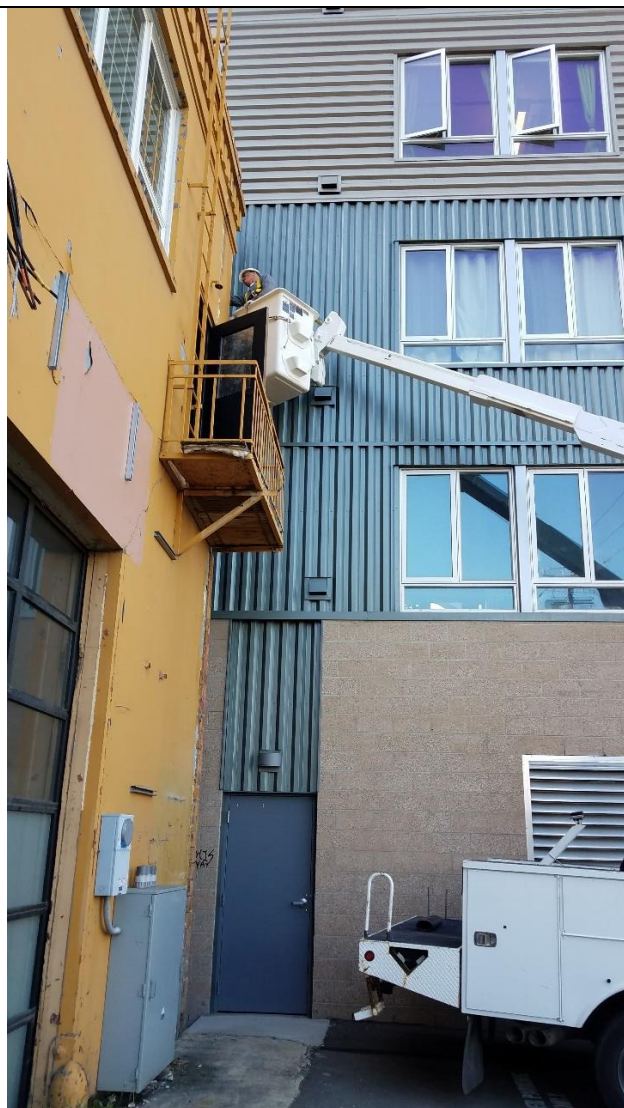
1


Access to the Concrete Area on the South Elevation of Building 15


Safe access to the concrete area on Building 15 where testing took place was challenging due to the fact that a new building, which can be seen in the photograph, was constructed less than two feet immediately adjacent to the south elevation exterior wall since the time paint abatement occurred in 2016.

Given the field conditions, proper and legal use of a ladder to access the testing area in the very tight space could not be achieved.

As a result, a bucket truck aerial lift was obtained and used to gain correct access to the limited area.

2

Bucket Truck Aerial Lift In Use

The photograph shows that access into the space between the two buildings to collect the sample was limited.

3		<p>Typical example of Testing</p> <p>Blue lines are from layout of sampling grid pattern.</p> <p>Surface debris was removed using a clean brush and cloth prior to drilling.</p> <p>Samples were collected using an impact hammer drill with a 5/8 inch concrete drill bit to generate a uniform, finely ground powder. Depth was controlled to be no more than one half inch by marking the depth with tape on the drill bit.</p> <p>The brown paper was taped to the wall to collect the sample material.</p>
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SAMPLE SUBMISSION

NVL maintained exclusive custody, control and security of samples collected and relinquished them to the selected laboratories for analysis using laboratory specific Chain of Custody (COC) forms that included fields for sample identification number, parameter for analyses, sample collection date and custody transfer signatures.

Per NVL's *Substrate Sampling Plan*, samples were submitted to accredited laboratories for analysis for PCB Aroclor content via EPA Method 8082. A Reporting Limit (RL) of less than 1 ppm was requested at the time of sample submission.

The laboratories selected for sample analysis were:

- NVL Laboratories, Inc.
- Fremont Analytical Inc.

RESULTS

The following table summarizes the results for concrete substrate testing:

CONCRETE SUBSTRATE TESTING RESULTS							
Sample Identification	Sample Type	Lab	Sample Collection Date	Sample Grid Location #	Lab RL	Total PCBs Analytical Results (PPM)	Result More Than 1 PPM?
101316-Bulk	-	F	10/13/16	29	0.180	0.522	NO
080619-15S-22-S1	SPLIT	NVL	08/06/19	22	0.91	ND	NO
080619-15S-22-S2	SPLIT	F	08/06/19	22	0.0925	ND	NO
080619-15S-08-DUP1	DUP	NVL	08/06/19	08	0.95	ND	NO
080619-15S-08-DUP2	DUP	NVL	08/06/19	08	0.90	ND	NO
ND = Non-Detect PPM = Parts per million or milligrams per kilogram (mg/kg) Lab RL = Laboratory Reporting Limit N = NVL Laboratories F = Fremont Analytical							

DISCUSSION

Laboratory analysis did not detect any level of PCBs equal to or above 1 ppm in any of the samples. All samples were run with a reporting limit of less than 1 ppm. All sample results were below the requirement for unrestricted use.

Field QA/QC Procedures

Field Duplicate Samples:

- Reproducibility and representativeness of the samples was confirmed with the results of the field duplicate samples. The field duplicate samples were separate samples collected as close as possible to the same sample location and analyzed by the same laboratory (NVL). Analysis results for both duplicate samples did not detect the presence of PCBs with a reporting limit of less than 1 ppm. This meets the QA/QC requirement that laboratory analysis results must be within 75 to 125 percent of each other to be acceptable.
- A duplicate sample was taken at one of the three testing locations. In other words, 33% of the three samples taken from the three locations had a "field duplicate" which meets the QA/QC procedure criteria that a minimum of 10% of the sample set be field duplicates.

Split Samples:

- Accuracy and reproducibility of the analytical results was confirmed by the split samples. The analytical results of splitting a sample and having it analyzed at two separate laboratories (NVL Laboratories and Fremont Analytical) did not detect the presence of PCBs with a reporting limit of less than 1 ppm. This meets the QA/QC requirement that laboratory analysis results must be within 75 to 125 percent of each other for the split sample results to be acceptable.
- One sample from the three sample locations was identified as a Split Sample that was submitted to another laboratory for analysis. This is 33% of the sample locations and 25% of the 4 samples submitted to the same laboratory, which meets the QA/QC procedure criteria that a minimum of 5% of the sample set be split samples.

Laboratory QA/QC Procedures

- Both NVL Laboratories and Fremont Analytical followed the QA/QC procedures that are requirements of NVL's *Substrate Sampling Plan* which include the addition of surrogates, laboratory control sample (LCS) and LCS duplicate, matrix spike (MS) and MS duplicate and continuous calibration check (CCV) sample for all PCB analysis. All results of QA/QC procedures were within analytical protocols. Copies of the laboratory analysis are included with this report which details the QA/QC information.

CONCLUSION

Sample selection was representative of the population in that all concrete substrate was equally considered during the random selection process. Testing of the concrete substrate did not detect the presence of PCBs greater than 1 ppm with a Reporting Limit of less than 1 ppm. The findings re-confirm that the visual clearance standards approved for brick, mortar, and sandstone are also reliable to confirm and approve removal of paint from concrete substrates and that PCBs contained in the historical layers of paint applied to the concrete did not migrate into the concrete substrate. These findings meet the requirements of Condition 8 of the EPA's Risk Based Work Plan Approval (RBDA) for Rainier Commons. As a result, it is recommended that Rainier Commons again request modification to the RBDA to eliminate concrete substrate sampling requirements, effective as of the completion of Phase I.

Reviewed by:

Testing & Assessment Overseen by:



Munaf Khan
Project Manager
Laboratory Director / President



David Leonard MSPH, CIH
Certified Industrial Hygienist
Technical Resource Expert



ATTACHMENTS

Testing Reports:

- NVL Laboratories Inc. Batch Number 1916722
- Fremont Analytical Inc. Analytical Report Work Order Number 1908085
- NVL RC Substrate Sampling Report IPWP2 Building 15 Segment A, South Wall, January 19, 2017, which includes Fremont Analytical Inc. Analytical Report Work Order Number 1610258

REFERENCED

- Condition 8 of the EPA's December 18, 2013 Risk Based Disposal Approval for Rainier Commons (RBDA)
- NVL *Substrate Sampling Plan* (Exhibit 11 to Phase 1 IPWP), revised to include and match the EPA SOP.
- Visual clearance standards required in Condition 7 of the RBDA and Exhibit 11 of the IPWP-II Plan
- *PCB Substrate Testing, Concrete – Post Visual Clearance*, April 19, 2019